

### **REMARKS/ARGUMENTS**

Reconsideration of the application, as herein amended and in view of the following remarks, is respectfully requested.

#### **Status of Claims**

Claims 1-26 are pending in the application, with claim 1 being the only independent claim. Claims 1 and 11 have been amended.

#### **Overview of the Office Action**

Claim 11 stands rejected under 35 U.S.C. §112, second paragraph, because of the expression “the A1...is in a range of between 0% and 10% inclusive”.

Claims 1-5 and 22 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No. 5,717,226 (*Lee*).

Claim 6 stands rejected under 35 U.S.C. §103(a) as allegedly unpatentable over *Lee* in view of U.S. Patent No. 6,693,352 (*Huang*).

Claims 7-9, 23 and 24 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over *Lee* in view of U.S. Patent Application Publication No. 2003/0059972 (*Ikeda*).

Claims 10-13, 25 and 26 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over *Lee* in view of U.S. Patent No. 6,346,719 (*Udagawa*).

Claims 14-21 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over *Lee* in view of JP 2001036131 (*Udagawa II*).

**Amendment Addressing Informality**

Claim 11 has been amended for clarity to address the informality noted in the Office Action. In view of this amendment, withdrawal of the objection to claim 11 is respectfully requested.

**Summary of Subject Matter Disclosed in the Specification**

The following descriptive details are based on the specification. They are provided only for the convenience of the Examiner as part of the discussion presented herein, and are not intended to argue limitations which are unclaimed.

The specification discloses a light-emitting diode chip having an epitaxial semiconductor layer sequence 6 with an active zone 3 that emits electromagnetic radiation, and an electrical contact structure 10. The electrical contact structure 10 includes a radiation-transmissive electrical current expansion layer 7 which contains ZnO and has a front side surface facing away from the semiconductor layer sequence 6, and an electrical connection layer 9. The current expansion layer 7 has a window, in which the connection layer 9 is applied to a cladding layer 5 of the semiconductor layer sequence 6. The cladding layer 5 is the only layer of the semiconductor layer sequence 6 that is adjacent to the connection layer 9. *See* Figs. 1 and 2 and paragraphs [0007], [0035] and [0037] of the specification. The cladding layer 5 is p-doped (*see* paragraphs [0015] and [0034] of the specification).

The connection layer 9 is electrically conductively connected to the current expansion layer 7 and has a junction with the cladding layer 5. However, the connection layer 9 does not cover (*see* Fig. 1) or only partly covers (*see* Fig. 2) the front side surface of the current expansion layer 7. When an electrical voltage is applied to the light-emitting diode chip in the operating direction, the junction between the connection layer 9 and the cladding layer 5 is not electrically

conductive or is only poorly electrically conductive so that the entire, or virtually the entire, current flows via the current expansion layer 7 into the semiconductor layer sequence 6, rather than directly from the connection layer 9 to the cladding layer 5. *See* Figs. 1 and 2 and paragraphs [0007], [0040] and [0044] of the specification.

During operation, as a result of this structure, no current, or at least less current, is injected into the region directly below the connection layer 9. Therefore no light, or at least less light, is generated in this region and absorbed by the connection layer 9 (*see* paragraph [0008] of the specification).

### **Allowability of the Claims**

#### **Independent Claim 1**

Applicants have amended claim 1 to more clearly point out the differences between the claimed invention and the teachings of *Lee*.

Amended claim 1 now recites, *inter alia*, the following:

“wherein the current expansion layer has a window, in which window the connection layer is applied on a cladding layer of the semiconductor layer sequence, said cladding layer is p-doped, and said cladding layer is the only layer of the semiconductor layer sequence that is adjacent to said connection layer within said window,

wherein a junction between the connection layer and the cladding layer, during operation of the light-emitting diode chip, is not electrically conductive or is only poorly electrically conductive such that an entire, or virtually the entire, current from the connection layer flows via the current expansion layer into the semiconductor layer sequence” (emphasis added).

Amended claim 1 is not anticipated by *Lee* because *Lee* fails to disclose, either expressly or inherently, the above-quoted limitations of amended claim 1.

On pages 2 and 3 of the Office Action, the Examiner refers to Fig. 3c of *Lee*, and contends that *Lee* discloses an epitaxial semiconductor layer sequence 31/32/33/34. However, as

clearly shown in Fig. 3c of *Lee*, in *Lee* a transparent electrode 35 is formed on a p-type contact layer 34 which in turn is formed on a cladding layer 33; a contacting metal 36 is formed in a hole and in contact with the cladding layer 33. The hole passes through both the transparent electrode 35 and the p-type contact layer 34 (see Fig. 3c and col. 4, third paragraph of *Lee*). In other words, in *Lee* both the cladding layer 33 of semiconductor layer sequence 31/32/33/34 and the p-type contact layer 34 of the semiconductor layer sequence 31/32/33/34 are disposed adjacent to the contacting metal 36. Therefore, *Lee* fails to disclose a structure in which “said cladding layer is the only layer of the semiconductor layer sequence that is adjacent to said connection layer within said window” (emphasis added), as expressly recited in amended claim 1 of the present application.

In addition, on page 3 of the Office Action the Examiner contends that *Lee* also discloses the limitation “wherein a junction between the connection layer and the cladding layer, during operation of the light-emitting diode chip, is not electrically conductive or is only poorly electrically conductive such that an entire, or virtually the entire, current from the connection layer flows via the current expansion layer into the semiconductor layer sequence” of claim 1, reasoning that this limitation is inherently disclosed in *Lee* because “*Lee* discloses the material and structure substantially identical to claimed invention” (emphasis added). However, as discussed earlier, the material and structure of *Lee* are not in fact substantially identical to the claimed invention. It therefore cannot properly be presumed that the above-quoted limitation of claim 1 is “inherently disclosed” by *Lee*. The Examiner’s attention is respectfully directed to Applicants’ May 5, 2005 Amendment which included additional discussion regarding the quoted limitation of claim 1.

In view of these noteworthy differences between Applicants' claimed invention and the teachings of *Lee*, withdrawal of the §102(b) rejection of claim 1 is deemed appropriate and requested.

Applicants further submit that the above-discussed differences between amended claim 1 and *Lee* clearly and patentably distinguish the subject matter of amended claim 1 thereover under 35 U.S.C. 103(a) and that none of the additional cited art teaches that which is missing from *Lee* in the same context.

#### Dependent Claims 2-26

Claims 2-26 depend, either directly or indirectly, from amended independent claim 1 and, as such, each is deemed to be allowable therewith.

In addition, these claims include features which serve to still further distinguish the claimed subject matter over the prior art of record.

#### Conclusion

Based on all of the above, applicants submit that the present application is now in full and proper condition for allowance. Prompt and favorable action to this effect, and early passage of the application to issue, are respectfully solicited.

Should the Examiner have any comments, questions, suggestions or objections, the Examiner is respectfully requested to telephone the undersigned to facilitate an early resolution of any outstanding issues.

Respectfully submitted,

COHEN PONTANI LIEBERMAN & PAVANE LLP

By

  
Lance J. Lieberman

Reg. No. 28,437

551 Fifth Avenue, Suite 1210

New York, New York 10176

(212) 687-2770

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